IN THE CLAIMS:

Please amend the claims as follows:

1. (Original) A planar optical waveguide, comprising:

a layered film formed on a substrate; and

an optical waveguide core formed in said layered film;

wherein a cross section of said optical waveguide core is substantially quadrilateral;

wherein a dopant layer including refractive index-lowering molecules is provided around said optical waveguide core having a substantially quadrilateral cross section; and

wherein said refractive index-lowering molecules included in said dopant layer are unevenly distributed in said optical waveguide core with a concentration that is higher toward outer sides and corners of said optical waveguide core, whereby a graded-index optical waveguide is constituted.

2. (Original) The planar optical waveguide according to claim 1,

wherein said dopant layer is formed on said substrate; and

wherein said optical waveguide core is formed on said dopant layer.

3. (Original) The planar optical waveguide according to claim 1,

wherein said dopant layer is formed on an upper side of said optical waveguide core.

4. (Original) The planar optical waveguide according to claim 1,

wherein said optical waveguide core comprises a polymer material;

wherein said refractive index-lowering molecules comprise fluorinated compatible molecules whose fluorine concentration is higher than that of said polymer material; and

wherein said fluorinated compatible molecules are reacted with reactive groups included in said polymer material to immobilize said fluorinated compatible molecules by chemical bonding.

5. (Original) The planar optical waveguide according to claim 4,

wherein said polymer material is at least one fluorinated polymer material selected from the group consisting of fluorinated polyimide, fluorinated polysiloxane and fluorinated polymethacrylate resins; and

wherein said refractive index-lowering molecules comprise fluorinated compatible molecules whose fluorine concentration is higher than that of said fluorinated polymer material.

6. (Currently amended) A method for manufacturing a planar optical waveguide, comprising:

(a) a step of forming a first dopant film including refractive index-lowering molecules on a substrate;

(b) a step of forming a thin film to serve as optical waveguide core on the substrate, and subsequently forming an optical waveguide core with substantially quadrilateral cross section by etching said thin film;

(c) a step of forming a second dopant layer including refractive index-lowering molecules on an upper side of said optical waveguide core with substantially quadrilateral cross section; and

(d) a step of doping the refractive index-lowering molecules from said first and second dopant layers into said optical waveguide core with substantially quadrilateral cross section, whereby said refractive index-lowering molecules ~~is~~ are distributed unevenly with a concentration that is higher toward outer sides and corners of said optical waveguide core.

7. (Original) The method for manufacturing a planar optical waveguide according to claim 6, wherein step (d) includes a thermal processing step.

8. (Original) The method for manufacturing a planar optical waveguide according to claim 6,

wherein said refractive index-lowering molecules are fluorinated compatible molecules; and

wherein, by at least one process selected from the group consisting of UV light processing, electron beam processing, plasma processing and thermal processing, a polymer material constituting said optical waveguide core is reacted with reactive groups included in said fluorinated compatible molecules, which are the refractive index-lowering molecules with which the optical waveguide core is doped, whereby said polymer material and said fluorinated compatible molecules are immobilized by chemical bonding.

9. (Currently amended) A planar optical waveguide having an optical waveguide core,

wherein said optical waveguide core is formed over a substrate;

wherein a low refractive index layer including refractive index-lowering molecules is formed around said optical waveguide core; and

wherein said optical waveguide core includes said refractive index-lowering molecules at its periphery, and

wherein said refractive index-lowering molecules are distributed with higher concentration toward the outer sides of said optical waveguide core.

10-26. (Cancelled)